

WHAT IS CLAIMED IS:

1. A waveguide configuration comprising:

- a core having an index of refraction and a shear velocity;

- a first cladding extending about the core having a shear velocity which is less than that

of the core and an index of refraction which is less than the core;

- a second cladding extending about the first cladding, the second cladding having a shear velocity which is greater than that of the first cladding, wherein an optical mode has an index of refraction greater than that of the second cladding; and

- a buffer extending about the second cladding,

- wherein, the core is selected from the group consisting of: Aluminum doped glass fiber, Aluminum and Phosphorus doped glass fiber, and, Aluminum and Germanium doped glass fiber, and Aluminum and both Germanium and Phosphorus,

- wherein the first cladding is selected from the group consisting of: Germanium doped glass fiber, Germanium and Boron doped glass fiber, Germanium and Fluorine doped glass fiber, Germanium, Boron and Fluorine doped glass fiber, Boron doped glass fiber and Fluorine doped glass fiber, or Boron and Fluorine doped glass fiber., or the foregoing combinations wherein phosphorus may be substituted for or used in conjunction with Germanium; and

- wherein the second cladding is selected from the group consisting of: undoped glass fiber.

2. The waveguide configuration of claim 1, wherein the cross-sectional configuration of each of the core, the first cladding and the second cladding are substantially uniform along the

length thereof.

3. The waveguide configuration of claim 1 further comprising a third cladding positioned between the second cladding and the buffer, the third cladding having an index of refraction less than each of the core, first cladding and second cladding.

4. A waveguide configuration comprising:

- a core having an index of refraction and a shear velocity;
- a first cladding extending about the core having a shear velocity which is less than that of the core and an index of refraction which is less than the core;
- a second cladding extending about the first cladding, the second cladding having a shear velocity which is greater than that of the first cladding, wherein an optical mode has an index of refraction greater than that of the second cladding; and
- a buffer extending about the second cladding,
- wherein the core comprises one of a rare-earth dopant and an undoped glass fiber,
- wherein the first cladding is selected from the group consisting of: Boron doped glass fiber, Fluorine doped glass fiber, and, Boron and Fluorine doped glass fiber, and
- wherein the second cladding has a higher relative doping concentration of Boron, Fluorine, or Boron and Fluorine than the first cladding and also contains Aluminum.

5. The waveguide configuration of claim 4 wherein the rare-earth dopant comprises one or

more of the group consisting of Erbium, Ytterbium, or Neodymium.

6. The waveguide configuration of claim 4 further comprising a third cladding positioned between the second cladding and the buffer, the third cladding having an index of refraction less than each of the core, first cladding and second cladding.

5